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MASSAGE IN TRAUMA

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Reprinted from
THE RAILWAY SURGICAL JOURNAL.
March, 1907.

ENGELBRECTION

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MESSAGE IN TRAUMA.*

DR. FERD. ENGELBRECTION, CHICAGO.

Massage is a French word derived from the Arabic "mass." pressure, and a Greek word which means to knead, and may be defined as certain manipulations performed on the tissues of the body with the object of improvement of the circulation, absorption and metabolism.

This definition excludes from the domain of massage such manipulations as taxis in hernia, or those used in reducing an invagination or ileus, reposition of uterus, Crede's method of expressing the placenta, and, of course, reduction of fractures and dislocations.

While massage is practiced in conjunction with, it should not be confused with, medical gymnastics, more popularly known as Swedish movements, which may be defined as movements or combination of movements, performed either as passive or active, if active, with or without assistance or resistance, with the object of improving strength and control of muscles, circulation and metabolism.

The earliest mention of massage in literature

*Read at the fourth annual meeting Rock Island System Surgical Association, Hot Springs, Ark., December 5, 6, 1906.

is probably in the writings of Kong-Fu (2700 B. C.), where he describes a regular system of massage and exercises with which to combat various ailments. It is mentioned in the "Vedas" of India and was a part of the religious directions in the laws of Manu. It is known that it was practiced in ancient Persia and Egypt, the name of a famous Phenician masseur and gymnast, Elix, has been preserved. The earliest practice of massage in Europe originated in Greece, where it was in general use and highly recommended by, among others, Hippocrates (460-577 B. C.) for sprains, reduced luxations and constipation; Galen in Rome (151-201 A. D.) paid great attention to this branch of mecanotherapy. In fact, massage and gymnastics has been known and practiced by the medical profession and the laity since time immemorial, but the scope of this paper will not permit to go deeper into the history of the subject.

The physiologic action of massage depends on the manipulations employed and upon the structures operated upon. To the nervous system it may be sedative or stimulating, local or general, direct or by reflex, hence its employment for nervous disorders of nearly all varieties, which should not be forgotten in traumatic hysteria, but to fully understand the advantage of massage in traumatism, it will be necessary to go into detail as to its action on the circulatory system as affected by the different manipulations. These are *effleurage*, *petrissage*, *friction* and *tapotement*.

By effleurage we understand centripetal strokings with the hand, its palmar surface, ulnar or radial margin, thenar eminence or base, one or both at a time, mostly in direction of, and over the paths of large veins and lymphatics, and with varying pressure, with or without lubricants (if continued for a long time, or if the operator's hands or patient's skin is moist, a bland non-irritating fat should be used as a lubricant).

The effect is primarily superficial; secondarily, deep, compressing and emptying centrally the superficial veins, lymphatics and capillaries, driving their contents toward the heart, thus allowing them to be refilled from the more deep and distal vessels, reducing intravascular pressure in these. If this manipulation is continued a short time at frequent intervals, it will prevent and reduce local congestion and stasis in the tissues affected. It should start on the proximal side of the seat of injury and gradually each stroking starts nearer until finally this is all covered, not more than ten minutes should be given in a local *acute* case, but as much as three or four times a day when practical, is of value. In chronic cases the treatment may last longer and the intervals may be extended. For the directly affected area, if very painful, a more sedative manipulation may be used, which is alternate compression and relaxation with one or both hands. The pressure should at first be slow and gentle, later firm, deep and synchronous with the heart

beat. This acts as an extra heart at the area worked upon, the valves of the vessels insuring the current of the fluids in the right direction. It is evident that this treatment is indicated in, and of great value in, all simple inflammations of more or less acute character as contusions, distortions, *reduced* luxations, simple synovitis, bursitis, tendovaginitis and ecchymosis. It must be understood that the earlier after the injury the treatment is started the better, as extravasation and organization of the extravasated substances is prevented, and often an inflammation that would otherwise set in may be entirely aborted, owing to the prevention of stasis.

Due to the improved circulation thus maintained, the facilities will be greater for carrying off broken down structures and for better supply of nutrition and reconstructive material. This will insure an improved function of the cellular elements and promote a more rapid healing of a lesion with the least possible cicatrization. Thus effleurage is indicated in such injuries of any tissue, where, due to poor circulation or disturbed nutrition from any cause, the healing of the lesion does not proceed in the normal manner, and it may for the same reasons *prevent* bed sores and senile gangrene.

Petrissage refers to grasping of the tissues, usually masses of muscles, in one or both hands, pinching, rolling, kneading all through the mass until every portion is worked upon. The action is, first, every pressure compresses veins,

capillaries and lymphatics, as in effleurage, but acting directly more deeply; secondly, the pinching produces a contraction of the muscle fibers acted upon, emptying their vessels, which are refilled by a fresh supply; thirdly, the rolling and kneading tends to break down any organized infiltrations and stimulate cellular activity and metabolism. This manipulation is indicated in muscular infiltration due to non-infective inflammation and in malnutrition due to inactivity, also to remove the products of *subsided* infectious inflammations. In a general massage where all the muscles of the body are thus worked upon, the peripheral resistance to the heart is reduced considerably which makes this treatment invaluable in all heart lesions where compensation is imperfect; of course, it also helps to *maintain* compensation when this has not as yet been implicated.

Tapotement consists of blows, raps or chopplings given with one or both hands, by the palm or ulnar edge, the tips of one or more fingers, the volar or dorsal surface of the fingers spread apart, or by the edge of the first finger. It is a powerful mechanical stimulant, the skin and peripheral nerve endings are best reached by blows of the flat hand, the nerve trunks by the finger tips, used like percussion in physical examination, but faster, and the muscles by chopplings made by the ulnar side of both hands alternately in quick succession transversely to the long axis of the muscles.

By friction we mean rubbings performed with the volar side of the thumb or the last phalanx of the three middle fingers. The pressure is often as great as possible and moving in small circles, thus allowing the cuticle of the patient to follow the excursions of the fingers.

The object is to promote the retrogressive metamorphosis of exudations and infiltrations and force the refuse so arising into the surrounding lymph channels. These manipulations and their effects merge imperceptibly into each other and none of them are used exclusively in a treatment, which may be local, affecting a local area, or special, affecting one or more organs, or general, affecting the whole system.

The usual manner of combining the different manipulations in a local treatment is as follows: First, we determine if we want a stimulating or sedative effect; in acute cases associated with much pain it should be sedative; in chronic cases where there are present infiltrations, organized exudations, adhesions or atony of muscles due to atrophy or fixation, the treatment should be decidedly stimulating. In some cases of old ankylosis an inflammation has to be produced to soften the tissues and permit absorption of the debris. This inflammation, however, being simple, can be kept under perfect control and terminated at any time. Contractures will have to be attended to gingerly so as not to stimulate reflex action and thus increase the contraction. Having de-

terminated the effect wanted, we commence with effleurage centrally to the lesion, gradually approach and cover this, then petrissage and frictions as indicated, and having thus loosened the products of inflammation repeat effleurage to pass them on in the circulation, then again more deep-seated petrissage, frictions or tapotement as indicated, followed by effleurage, passive or active movements, as indicated by atony, atrophy or paralysis.

The indications for massage are from the preceding easy to determine, and in general it may be said that massage is indicated in all conditions, local or general, where an improvement of circulation, absorption, metabolism, and due to this, an improved function and nutrition are desirable. But this is too general, and we will now consider its use in trauma more in detail.

As soon as a luxation is reduced massage is indicated, the sooner the better, for reasons already given, and the same rule holds good for contusions and sprains. It should be given at once or as soon as possible after the injury, as the extravasation thereby is prevented or limited as well as the subsequent adhesions and contractures.

In ordinary simple fractures where no articulation is directly involved, the usual time may be allowed to elapse before removing the cast or splint, to permit of massage, which in such cases merely serves to stimulate the circulation, stagnant or impeded from inactivity,

and by passive and active movements restore the normal function of the adjacent joints, and in some cases to hasten the retrogressive metamorphosis of a troublesome callus. But to obtain the best results in a simple fracture in close proximity to, or involving an articulation, a different procedure must be followed. The cast or splint is removed in the first agglutination stage, ten to fourteen days after setting, and massage is given in such way *as not to disturb the apposition in the least*, after which the cast is replaced and the treatment repeated every day. To succeed in this manipulation it is imperative that no movement be performed which produces any reflex muscular contraction; on the contrary, the parts must be so handled that any existing tension will disappear. The result of this treatment will be that in the same time or less that is required for an ordinary simple fracture to heal, this case will show bony union with *normal function* of the joint involved, whereas, if the cast is allowed to stay on until union is perfected, it will require a long time and hard work by the masseur to restore normal movement of the joint, and in some cases this result may be impossible.

In subjects where, on account of constitutional conditions, as senility, etc., a bony union is not expected, proceed in the same manner. If not anticipated and delayed ligamentous or non-union results, the connection between the fragments, if any, should be broken up, the surfaces rubbed against each other, then reset,

immobilize for a week or ten days, then treated the same way as described for fractures with articular complications. This procedure should insure a perfect bony union.

In faulty or vicious union where a correction by refracture or operation is impractical, massage will frequently relieve the patient and has often restored function to a nearly perfect condition.

Massage will restore function in any ankylosis where the synovial membrane is not destroyed or where new formed bony structures do not interfere too much.

Products of inflammation remaining in any tissue, as infiltrations, adhesions, contractions, cicatrices, except from burns, will also be absorbed under massage.

Finally, in such cases where an operation has to be performed which is not urgent as to time and the surgeon has some fear as to the patient's ability to withstand the shock, or nutrition or vital resistance is poor from any cause, massage is indicated before the operation. This should be general, excluding any part affected by contraindications, and will not only directly strengthen the heart, but will insure a better resistance against toxins and infection. A prominent surgeon has said that he did not want massage before an operation because the increased circulation would favor the spread of any infection, but we must remember that the cellular elements are stimulated and strengthened by an improved circu-

lation, and that their absorption is selective, and if they are in good condition they can better resist infection than when half dead from deprivation of nutrition and oxygen and poisoned by carbon dioxid and other refuse matter, due to stagnation of the circulation. For the same reason, massage is valuable as post-operative treatment in selected cases.

Contraindications:

General: All acute general infections. Local infection only prevents massage in the locality affected. In abrasions, wounds, ulcers, local massage may be used if perfect aseptic precautions are observed. Local massage is excluded in the vicinity of local infections of any kind, malignant tumors, varicose veins, aneurism, thrombus less than two years old, hernia if strangulated, foreign bodies, luxations, if not reduced, unhealed fractures, with modifications as already given.

A few words in conclusion: While massage as here outlined appears to be a very simple matter to undertake, it requires a familiarity with physiology, pathology and anatomy on the part of the operator. It is too hard work for nurses who may be tired out by other duties, and if performed by them may be hardly more than skin deep, directions to the contrary notwithstanding. If performed by a member of the patient's family, all these objections hold good and this may explain why so many physicians who have tried this treatment have had discouraging results. In an acute case it is

not hard work for the physician to perform, and if started in time inestimable service may be rendered to the patient, incidentally increasing reputation and fee of the practitioner. In localities where no expert masseurs are to be found, and it is impracticable for the doctor to carry out the treatment, a younger member of the profession may be found who is willing and able to do the work. All graduates ought to have a practical training in this work.

A great many works have been written on this subject, but the best work I have seen in English is in Vol. VII. of Cohen's "System of Physiologic Therapeutics," to which I can refer any one who is interested. Kleen's "Handbook of Massage," translated from the Swedish by Hartwell, treats of the subject in a conservative and scientific manner, but, unfortunately, has been out of the market for the last few years.

Case 1.—Mrs. G. Sprain of elbow, cast two weeks. Cast was taken off and joint broken up by force September 22; massage commenced following day, continued every day for five weeks and two days, 37 treatments; function and form of elbow perfect.

Case 2.—Dr. S. Diagonal fracture of tibia, upper extremity, from below upward and out, dividing articular surface. Massage commenced September 18, two weeks after accident, continued at first every day, later every other day to November 1, six weeks, 28 treatments; func-

tion of joint nearly perfect, slight limping; patient was 52 years old.

Case 3.—Mr. E. Total posterior dislocation of wrist, reduced inside of one hour, and massage commenced at once July 25, once a day to September 6, six weeks, 39 treatments; joint perfect in function and form with full strength.

Case 4.—Mrs. W. Fracture of tibia, transverse, 1 inch below knee. Two months after accident knee ankylosed, flexion at seat of fracture, great infiltration, poor circulation. Massage May 6, 7, 8, 9, 10, to reduce infiltration and improve circulation. On May 10, after massage treatment, the fragments of tibia were forcibly rubbed together and knee joint broken up under anesthesia, massage given and cast put on. Cast removed June 15, massage continued every day until July 4, three weeks, 18 treatments; patient left for home, union good and strong; patient walked without crutches, knee extended fully and flexed easily to right angle.

Case 5.—Mr. H. Comminuted fracture fibula and tibia, lower extremity, October 8, 1905, vicious union, foot appeared too far forward, patient could not step on foot for three months and twelve days after accident, when massage commenced January 20 and continued regularly to August 25, 128 treatments—9 months; patient has been working since August and had 16 treatments after that time; joint large, but function very good, walks without limping.

Case 6.—Mrs. U. Accidentally shot with an

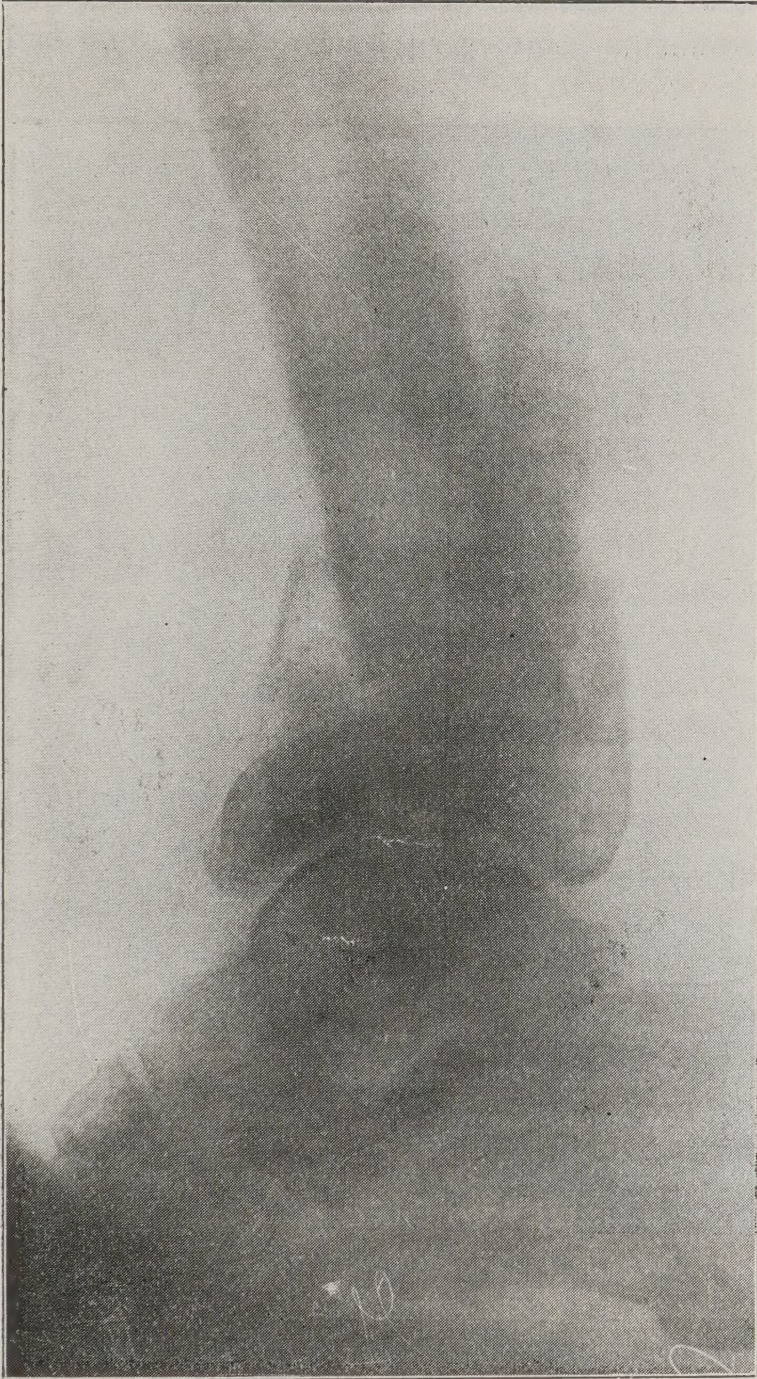


FIG. 1. SIDE VIEW OF ANKLE MR. H. (CASE V).

army revolver in elbow-joint, capitellum, the radial head of the humerus shot away. Passive movements commenced by Dr. Snow, who had



FIG. 2. SIDE VIEW OF ELBOW MRS. U. (CASE VI).

charge of the case, seven days after accident. Two weeks after accident, October 16, wound was healed by first intention. Massage was

given and continued every day until November 15th, four weeks—twenty-four treatments. Patient has nearly full extension of arm, pronation

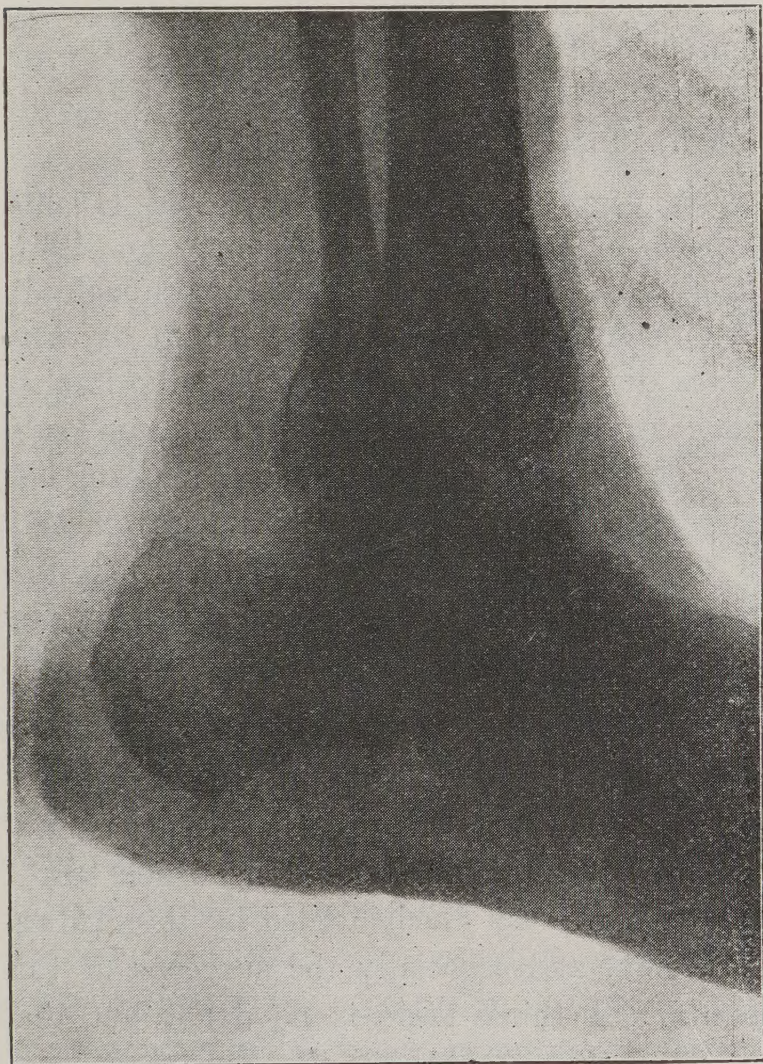


FIG. 3. SIDE VIEW OF ANKLE MR. K. (CASE VII).

tion and supination perfect, and by flexion can reach any part of her head and neck.

Case 7.—Mr. K., engineer. Foot injured in

railroad accident November 17. Vicious union, head of astragalus displaced upward, astragalus rotated outward, so that tibia rested on its inner articular border. On April 20 patient was unable to step on the foot. Massage commenced, continued daily until October 27—six months, 148 treatments. Function very good; a slight limp. Patient returned to work.

Case 8.—Mr. W., railroad fireman. Injury to back, lumbar region, November 17, 1904. On August 29, 1905, patient was unable to bend forward or backward on account of pain. It was diagnosed as rupture of left ilio-lumbar ligament, and probably of ligamentum subflava on the same side, with a synovitis of left sacro-vertebral articulation. Massage from May 29 to July 28 daily—two months, fifty-two treatments. Perfect function; no pain on any movement. Patient working.

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DISCUSSION.

Dr. R. A. Kerr, Peoria, Ill.: This exhibition by Dr. Englebrechtson is one which has, I believe, been very much needed by the medical profession, and especially the surgeons of this country. I think there is no doubt but that we are very much behind the European countries in the application and understanding of the possibilities of massage. The neglect on the part of the regular profession to make proper and scientific use of this very efficient means of treatment has led, and is leading, to

the establishment of irregular schools of medicine which depend entirely upon this one particular phase of treatment, and who imagine because they have a little grain of truth that they have the whole thing, and they presume to treat all diseased conditions of the body along the same lines. We realize that a little knowledge in medicine and surgery, as well as in other things, and probably more emphatically so, is a very dangerous thing. This particular cult to which I refer have a little knowledge that is correct, and they imagine they have much more than is actually true. In order to forestall, as it were, the tendency of the public to run after these fads which have a grain of truth in them, it is very essential that the medical profession adopt what is good and use it in a legitimate manner.

I would like to ask the essayist if he commences the treatment of a recent sprain, with evidence of torn ligaments, with the same kind of massage he illustrates. It is my understanding that when the ligaments are torn it is quite as essential, provided we have a solution of bony continuity, to maintain those ligaments in apposition, if possible, as it is to hold the fragments of bone in position, and with the maneuvers the Doctor subjected this joint to, I question whether it would be possible to maintain the ligaments in apposition. Another question is, whether Dr. Engelbrectson considers the form of vibratory massage by mechanical appliances, which is quite in vogue in this

country at the present time, of any value from a scientific standpoint.

Dr. E. S. McDonald, Cameron, Mo.: I have been very much interested in the manipulations illustrated by the essayist. I have recently had two or three cases of severe sprain of the ankle joint, and one or two of them were rather tardy in having function restored. To be sure, this is not new, but the profession has allowed it to drop out. Manipulation and massage are as old as Hippocrates, who flourished about 450 B. C., but the profession has lost sight of it and it has given place to the cult referred to by Dr. Kerr, and which has made somewhat of a reputation among the laity. The manipulations shown and the instructions we have received this afternoon are to me indeed very helpful and beneficial, and I appreciate it.

Dr. Engelbrectson (closing): I am very pleased with the kind sentiment with which you have received my demonstration. I will be glad to reply to the question asked by Dr. Kerr. This is a question that is very often asked regarding the ligaments. The opinion even among masseurs is somewhat divided, and where there has been very great rupture of the ligament some masseurs will not give any motions, passive or active, inside of four days. They consider that in that time the ligaments will heal. In my personal experience I do not pay the least bit of attention to ligaments. It is my opinion that the passive motions through which I put the foot, physiologically force the

ligaments into their proper place, and any shortening or induration the treatment does away with. That is the only way I can explain the uniform success I have had with sprains, and I do not think I put the figure too high when I say that I have treated at least 300 sprains of the ankle alone during my twenty-five years' practice in massage.

In regard to vibratory, or mechanical, massage, as a placebo it is very good, as a stimulant in general I consider it good. In certain local conditions I have heard reports from doctors that vibrators applied over the abdomen are very good for constipation; but to reduce infiltration, to get at certain spots where it is desired to restore normal condition, I have not found them useful. They are very good sometimes to lessen pain after painful treatments, for which I frequently use them. But that is merely a placebo; the pain will stop right after manipulation ceases. No matter how painful the massage is, if rightly given as soon as the manipulations producing the pain cease, the pain ceases, and the patient feels relieved, not only from the pain inflicted by the masseur, but from the pain he had before the treatment. I do not intend to say that all vibratory massage is useless; on the contrary, the pneumatic vibration of the tympanic membrane has restored good hearing to myself and many others.

